

DERIVATIVES AND CARBON MARKET DESIGN

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Carbon is a New Risk

- By passing a GHG emission cap, Congress is creating a new risk, similar to fuel or other input risk, that must be managed by emitters. OTC derivatives are used to offset or “hedge” risk in a customized and flexible manner.
- From a risk perspective, carbon is an input similar to fuel or other commodity.
- Existing commodity or financial risks are managed using the over-the-counter (OTC) markets and exchanges.

What is “Risk Management”?

- “Risk management” is essential to long term planning for large capital projects (e.g. natural gas power plant)
- Long term planning requires price predictability for inputs (raw materials, capital, and now carbon)
- Markets (over-the-counter/exchanges) match entities that need price predictability with those willing to provide it

What are derivatives?

- A derivative is a financial contract between two parties that exchange risk for financial payment. The value of a derivative is a function of one or more underlying variables
- Standardized, liquid derivatives can be traded on an exchange; customized or illiquid derivatives trade “over the counter” (OTC)
- Derivatives range from plain vanilla to complex and are typically based on one or more of the following risks:
 - Interest rates
 - Currencies
 - Credit
 - Commodities
 - And now--Carbon

Why are derivatives used?

Power Company uses of OTC derivatives:

Hedge Against Possible Carbon Price Increases. A power plant developer is seeking bank loans to finance a natural gas power plant. Typical loan is 5-7 years maturity and requires that inputs (i.e. fuel and carbon) be hedged. The developer could try to hedge on an exchange, but contracts with the needed size, duration and terms will very likely be unavailable. Even if proper contracts available, the developer must post approximately \$4 million in cash collateral (assume 50% hedge of 500,000 tons CO₂/yr X 8 year loan maturity) **Outcome: the developer uses OTC market, achieves precise hedge of its risk thru customization, posts first or second lien on the power plant, frees up \$4 million+ in cash**

Hedge Against Possible Fuel Price Increases. A power plant developer routinely buys natural gas to produce electricity. Any time natural gas prices rise, it needs more money. The developer could go to a bank for a revolving line of credit, but that is an expensive alternative because the developer would have had to pay a standing fee, even if it did not use the line of credit. Instead, the developer enters into a customized commodity price swap linked to the price of natural gas. **Outcome: By engaging in the customized commodity price swap, the developer avoids incurring indebtedness and paying the standing fee, which makes capital available for other purposes.**

Case Study: OTC Derivatives Essential to Financing Low Carbon Infrastructure

- Independent Power Producer (i.e., not a regulated utility that gets to push all development and compliance costs through rate base) proposes to build a 600 MW advanced coal facility (IGCC with CCS), located in a deregulated wholesale power market (e.g., PJM, ERCOT, NEPOOL, NYISO).
- Capital cost will be in excess of \$1 Billion, including the carbon scrubbing/storage equipment and costs.
- IPP will create a special purpose, project-specific company that will seek to use a full array of capital in its capital structure to get the project built. Approximately \$700 MM project debt to be borrowed.
- Project finance lenders will require key revenue (i.e. electricity sales) and inputs (i.e. carbon, fuel) to be hedged for a period that at least equals the term of the proposed project debt - likely 8-10 years.
- Because the project will be constructed in a power market - that is, there will not be a long term power purchase agreement to take and pay for the electrons produced pursuant to an identified cost structure - the only way the developers can firm up their initial revenue numbers is with a power hedge to be provided by a market player with financial specialization and sophistication in this area.

Case Study: OTC Derivatives Essential to Financing Low Carbon Infrastructure (cntd)

- Through an OTC derivative arrangement that will be entirely customized to the particular power plant proposed, a hedge counterparty can effectively provide revenue certainty for a certain proportion of the expected power generation of the project for a period of 8-10 years. This provides baseline revenue that the potential project lenders will look to in making their economic assessments of the proposed project and specifically whether it can service and amortize the proposed debt amount on a satisfactory schedule to the lenders, as well as meet operating costs of the project.
- On the cost/input side, the developers may - depending on their view of the energy commodities markets at the time of development - seek to enter into an OTC, highly customized derivative hedging transaction to take some of the price risk out of the fuel inputs to the project (e.g., coal), again for some period out in the future following the project's completion and entry into commercial operation. Lenders also may require the developers to put this hedge in place.
- Further on the cost side, and as the compliance market in the US quickly develops depth and liquidity, lenders will require that project developers hedge their carbon exposure for the term of the loan.
- Key point of OTC - apart from the tenor and high degree of customization - revolves around collateral: the availability of First and Second Lien as collateral, rather than the posting of cash collateral. Vast majority of IPP plant financings are conducted on a stand-alone basis, there is no separate pot of cash available. The only available collateral is a First or Second Lien on the plant itself, with the result that without access to the current OTC/customized mechanics, many projects simply will not get built.

Over-the-counter market versus exchange/cleared trades

Over-the-Counter

- Enables client to customize hedges
- Volumes
- Settlement timing
- Payment timing
- Larger array of products
- Ability to execute larger volumes at one price; avoid moving the market
- Flexible collateral: reduces or eliminates need to tie up liquidity (i.e. cash)

Exchange/Cleared trades

- Standardized contracts
- Daily margin calls
- Upfront collateral
- Limited tenor (i.e. duration) and limited liquidity in deferred periods
- Market movement likely through execution

Current proposals to regulate derivatives are problematic

- A majority of companies' ability to effectively hedge their carbon (and fuel) exposures could be compromised by current proposals. There are two key characteristics of these proposals - no customization and cash collateral - that could compromise companies' risk management objectives:
 - **Customization is impossible with mandatory clearing or exchange trading** — While OTC derivatives are not inherently complex products, their exact terms and conditions are highly tailored to manage specific risks. One of the key characteristics of OTC derivatives is their customization to a company's specific risk management needs. Exactly offsetting an exposure through a customized OTC derivative eliminates risk from the underlying transaction and allows companies to manage their risks exactly. By exactly offsetting an exposure through a customized OTC derivative, a company can eliminate the underlying risks that are unrelated to its core business.
 - **Cash collateral:** For a cleared transaction, the mark to market of the derivative would have to be posted in cash or treasury securities and adjusted for market moves twice per day. This would add a huge liquidity and operational burden. Currently companies can use their illiquid assets, such as inventory, machinery, and real estate, to collateralize their transaction.
- We believe that the passage of legislation as currently considered will significantly hamper emitters' ability to hedge their carbon and fuel exposures in addition to FX, interest rates and commodities, all of which have proven to be incredibly volatile markets, especially over the last year

Proposal: Require Clearing of Carbon OTC Derivatives Trades between Non-Compliance Entities (i.e. financials) and Mandate Disclosure of Carbon OTC Trades

- Give compliance entities (i.e. emitters) the ability to choose how to hedge their obligations and to trade OTC carbon derivatives. Non-compliance entities must clear their OTC carbon derivatives.
- Disclosure to regulators of position and all relevant information for OTC derivatives
 - Give regulators the information to promote market integrity
 - Expand upon existing regulatory and legal framework: existing anti-manipulation, anti-fraud, insider trading rules
- **Market Data Transparency: Allowance Tracking System** established by EPA provides timely and accurate information on positions of SO₂ emission allowances. Require similar public reporting of prices, trading volumes of allowances.
- Regulators obtain any other information whenever they would like.